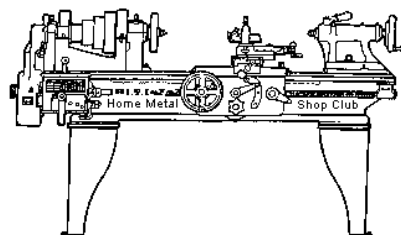




September 2013
Newsletter

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<http://www.homemetalshopclub.org/>

The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area since its founding by John Korman in 1996.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members enjoy getting together and talking about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings consist of **general announcements**, an **extended presentation** with Q&A, a **safety moment, show and tell** where attendees share their work and experiences, and **problems and solutions** where attendees can get answers to their questions or describe how they approached a problem. The meeting ends with **free discussion** and a **novice group** activity, where metal working techniques are demonstrated on a small lathe, grinders, and other metal shop equipment.

President <i>Vance Burns</i>	Vice President <i>Norm Berls</i>	Secretary <i>Joe Sybille</i>	Treasurer <i>Emmett Carstens</i>	Librarian <i>Dan Harper</i>
Webmaster/Editor <i>Dick Kostelnicek</i>	Photographer <i>Jan Rowland</i>	CNC SIG <i>Dennis Cranston</i>	Casting SIG <i>Tom Moore</i>	Novice SIG <i>Rich Pichler</i>

This newsletter is available as an electronic subscription from the front page of our [website](#). We currently have over 456 subscribers located all over the world.

About the Upcoming 12 October Meeting

Gene Rowan will give a presentation on "Welding machines for home shop duty and commercial machines for business duty."

General meetings are usually held on the second Saturday of each month at noon at the Jungman Library, located at the intersection of Westheimer Road and Augusta Drive (west of the Galleria) in Houston, Texas. Visit our [website](#) for up-to-the-minute details, date, location, and presentation topic for the next meeting.

General Announcements

[Videos of recent meetings](#) can be viewed on the HMSC website.

The HMSC has a large library of metal shop related books and videos available for members to check out at each meeting. The library is maintained by the [club librarian, Dan Harper](#). These books can be quite expensive, and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership.

We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the [webmaster Dick Kostelnicek](#). In the September, 2012 HMSC board meeting, the board elected to waive membership fees during the next membership renewal cycle for those providing newsletter articles.

Ideas for programs at our monthly meeting are always welcome. If you have an idea for a meeting topic, or if you know someone that could make a presentation, please contact [vice president Norm Berls](#).

Recap of the 14 September General Meeting

By Joe Sybille, with photos by Dick Kostelnicek



Twenty six (26) members attended the noon meeting at the [Jungman Library](#). There were no guests present. President *Vance Burns* led the meeting.

The club has funds to purchase new books for the library. If you have suggestions, contact the [librarian, Dan Harper](#).

Presentation

Club member *Martin Kennedy* gave a presentation on “High Speed Machining On a Low Quality Mill.” A visit to a local machine tool show served as the inspiration for Martin's project. He saw live high speed machining demos and was impressed. After seeing the advantages of high speed machining, his goal became clear: to upgrade his low quality Round Column Mill CNC conversion to perform high speed machining.

He began his presentation by showing a video of a high speed milling operation to make a complex part. It had slots, rounded corners, and finished surfaces at different depths. Although it was steel, the entire operation was completed in less than 10 minutes.

Martin discussed calculations of two major settings for milling operations: spindle speed and feed rate. Martin said that he found that the calculations returned



Martin Kennedy

results that had feed speeds too high and spindle speeds too slow.

Generally, high speed mill machining requires a CNC (Computer Numerically Controlled) mill, carbide cutting tools, and a CAM (Computer Aided Manufacturing) software program. Martin upgraded the CNC hardware controlling his mill. Changes made included replacing the stepper motors, rewiring the motor controllers, upgrading the power supply and installation of a Smooth Stepper.

In high speed machining, corners are made by making a series of arcs of decreasing radii to obtain constant mill engagement (essentially constant horsepower). This technique is called trochoidal milling. Making slots with high speed machining utilizes a modified version of this technique, which yields a series of D shaped looping cuts.

Several test cuts were conducted, which proved that some of the speed of a commercial high speed mill could be obtained on a low quality mill. The maximum speed of Martin's mill was 4,000 rpm, and he found that cuts could be made at a speed of 60 ipm, using the full depth of the bit and a step over of 0.015-inches. This is about 1/3 the rotational speed of a commercial mill, and about 1/3 of the feed rate they obtain.

Here is the link to Martin's [presentation slides](#).

Safety Moment

Vance Burns reminded members to refrain from slamming on brakes while driving to avoid passing a driveway entrance. The driver in the vehicle following may not react fast enough to avert a collision.

Dan Harper shared his experiences as a teacher of driver education. As a follow-on to Vance's comments, Dan remarked how he encouraged his students to avoid making quick stops. Distracted drivers on cell phones talking or texting may not react quickly to avoid an accident.

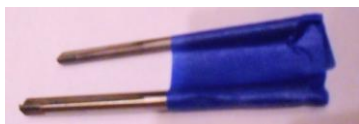
Norm Berls reminded members to be extremely cautious when following trucks with a load of materials. He witnessed one truck losing pieces of metal because of an inadequately secured load. This was a dangerous situation because metal flying from the truck and landing on nearby vehicles had the potential to cause serious injury to both drivers and passengers.

Vance Burns remarked that it is important to ensure cargo carried in trailers and in truck beds is properly secured with tie-down straps. Otherwise, one could create a road hazard by unsecured items falling in the path of moving vehicles.

Johnny Elliott advised members to twist tie-down straps when securing cargo. Doing so minimizes strap vibration due the wind velocity.

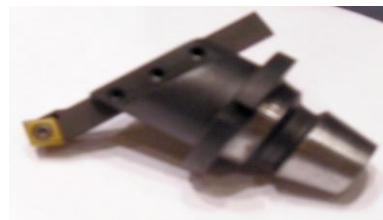
Dean Eichler recommended to members the use of fishtail bits when drilling holes in sheet metal. These bits make holes with fewer burrs, if any, when compared to the standard twist drill bit.

Show and Tell



Joe Williams displayed drill bits designed with parallel flutes and carbide tips. These bits, used with a guide bushing, are excellent for drilling holes in high strength steel (photo at right).

Martin Kennedy showed an example of a Parkerized fly cutter. He made the tool as part of a previous project and wanted to minimize surface rusting on the tool (photo at right). For more information on Parkerizing tools, see the [February 2011 newsletter](#).



Mike Winkler brought a prototype of a sling adapter-attachment he made for an AR-15 rifle stock (photo at left).

Vance Burns brought in a pocket knife with an assisted opening feature. He purchased the knife



from a local sporting supply store (photo at right).



Johnny Elliott showed pictures of a trailer with tandem axles he made for hauling cars. A distinctive feature of the trailer is the tilting deck to facilitate loading of his race car (photo at left).

Vance Burns spoke about the [Falkirk Wheel](#) located in Scotland between Edinburgh and Glasgow in the Forth Valley. The wheel is a rotating boat lift connecting two canals of different elevations. The Falkirk wheel is a major tourist venue in Scotland.

Problems and Solutions - *Ask the Blacksmith*

A club member had trouble finding a source of round stock with ACME threads and asked for recommendations. Several local sources were offered.

Another member wanted to know the purpose of the two holes often found in precision parallels. One member suggested the holes were for pins to facilitate alignment of parallels when supporting a workpiece in a vise or in a jig.

Novice SIG Activities

The novice group did not meet today due to the unavailability of the SIG leader.

Articles

Recovering from an Imprudent Motor Reversal

By Alan May



I have a heavy 10-inch South Bend lathe on a sheet metal stand. I switched it on in reverse, noticed my error, and too quickly changed to forward. At least I think that is what happened. Whatever I did, the motor jumped out of the rubber mount at the non pulley end. It wedged itself at an angle and bent the bracket out of square. There was no way to straighten the bracket with the motor in place.

The lathe was born in the mid 80s, and the motor is quite heavy. No problem, except I have passed my 80th birthday and am 4-½ weeks into a left knee replacement, no kneeling on it right now. I can't hold the motor up with one arm and do much with the other even if I could kneel on both knees. I also found that certain positions can bring about cramps in my upper thighs, which slowed progress to a considerable extent.

Anyway, by sitting in odd positions, I started to unhitch the motor from the rubber mounts. These are the kind of mounts that have two-piece metal clamps that are slotted at one end in order to hook to the bracket and they are fastened with a screw at the other end (similar to the mount in the right photo). No problem for the end that jumped out of the clamp, but the pulley end screw head was toward the back of the cabinet, and naturally, it was a plain slotted screw. Also there was not much room for a screwdriver, nor room for a guiding finger near the screw's head because of the pulley. I just couldn't unscrew it from the back side.



I propped the motor up with a small Sears hydraulic floor jack that I bought years ago. Back then I drove enough to wear out my car's brake shoes. I quit for the day, took a shower, followed by at least a couple of drinks while I contemplated the shame of calling some sort of machinery repair outfit.



I had a thought in the shower. I figured I could cut a slot in the protruding small end of the screw with a Moto tool and then loosen it with a screwdriver (left photo). Worked like a charm! Bending the bracket square was no problem, but now to reassemble. I will skip all the plans that did not work, most of which involved the motor falling off the jack. I realized that I needed a basket that fit the motor and was fastened to the jack. I removed the little spinner meant to be the jack's contact point which left a ½-inch hole for a bolt. A wood 2X2 fit nicely between the capacitor cans which are attached to the bottom of the motor as it is mounted. Just a little steadying with one hand while operating the jack with a scrap ¾-in rod with the other lifted the motor right in place. I think it would have been pretty easy to make a basket to hold any shape of motor. A 2X6 with a couple of 1X2s on edge would

also have work quite well.

All the action with the motor was too much for the flexible electrical power conduit attached to the motor, which broke again. That stuff is not made to accommodate a lot of movement. It had broken before just from vibration. I patched it up with a yard or two of electrical tape.

I am sharing all this because I never considered cutting a slot in the wrong end of a machine screw before. And I never thought to use a jack this way. Lucky I have one, but a new jack would be cheaper than hiring a repair. I saw one for sale at Home Depot recently for \$25. I expect that I may need it again. Those motor mounts are nearly 30 years old, and may fail any time. Looking at new motors, I suspect that the rubber mounting rings are glued to the motor. Not mine, any more. Granger sells all the replacement metal parts but I can't find new rubber rings.

If I have to replace the motor, it will be a real challenge, all the wires are black. But now, I have my jack ready. Also, I think I will put a stop on the motor's switch in order to make it hard to reverse by accident.

Magnets on a Hydraulic Press

By Dick Kostelnicek

In a previous article I described a [Height Adjuster for a H-Frame Hydraulic Press](#) that uses four rotatable riser blocks (right photo). Each block has 3 flat support surfaces. These surfaces are at a different height from the central pin hole (left photo). Hence, the table can be raised by 1-inch increments rather than the 4-inch steps when only the support pins are moved.



Now, each riser block freely rotates on its 1-inch diameter support pin. Since these blocks are not rotationally symmetric, they tend to settle with the heaviest part pointed

downward. In order to prevent them from rotating when the horizontal table is lifted to a new position, I embedded three cylindrical niobium magnets flush with the back surface of each aluminum riser block (right photo). These magnets stick to the steel vertical frame members of the press, thereby, preventing self-rotation. Since four of these blocks must be matched in their rotation with similar flat surfaces pointing upward, I've tri-color coded the support faces to coordinate their positioning (above left photo).

